

CLAIMS

1. A method to dissolve at least one metal from jarosites or other iron hydroxy sulfate containing-material which includes the sequential steps of:

5 a. subjecting the material to alkaline treatment in a brine solution with a pH above 7 and at a temperature of from 30°C to 100°C to facilitate jarosite decomposition and produce a brine slurry which contains the metal; and

b. acidifying the brine slurry by reducing the pH of the slurry to less than 6 to solubilise the metal.

10 2. The method of claim 1 further comprising subsequent to acidifying the brine slurry, adjusting the pH of the brine slurry to remove solubilised iron or other impurities from the liquid phase of the slurry followed by separating a metal-containing brine solution and solid residue from each other.

15 3. The method of claim 2 further comprising removing a metal value from the brine solution using a technique selected from the group consisting of cementation, ion exchange, solvent extraction, electrowinning, or precipitation.

4. The method of claim 3 wherein, after the step of removing the metal value, a barren brine liquor is produced and is recycled for use in the alkaline treatment (step a).

20 5. The method of claim 4 which includes the steps of bleeding impurities from the barren brine liquor and adding NaCl and water to the barren brine liquor prior to the alkaline treatment.

6. The method of claim 1 wherein the alkaline treatment is conducted at temperature between about 50°C to about 90°C.

25 7. The method of claim 1 wherein the brine concentration of the brine solution is between 100g/l NaCl and saturation levels.

8. A method according to claim 7 wherein the brine concentration of the brine solution is between 200g/l and 300g/l NaCl.

9. The method of claim 1 wherein the brine concentration of the brine solution is the equivalent of any other soluble chloride salt.

10. The method of claim 1 wherein the temperature of the brine slurry during step (b) is between 30°C and 100°C.

5 11. The method of claim 10 wherein the temperature of the brine slurry during step (b) is between 50°C and 90°C.

12. The method of claim 1 wherein the pH of the brine solution during step (a) is between 9 and 13.

10 13. The method of claim 1 wherein the pH of the brine slurry during step (b) is between 1 and 3.

14. The method of claim 1 wherein the duration of step (a) is less than 24 hours.

15. The method of claim 1 wherein the duration of step (b) is less than 8 hours.

16. The method of claim 1 wherein the at least one metal is silver.